

U.S. DEPARTMENT OF COMMERCE PATENT & TRADEMARK OFFICE

B/O Form PTO-1390		Transmittal Letter to the United States Designated/Elected Office (DO/EO/US) Concerning a Filing Under 35 USC 371		Attorney's Docket Number HOFM3001/JEK	
				U.S. Application Number of Invention 1070669986	
International Application Number PCT/EP00/08699		International Filing Date 06 September 2000		Priority Date Claimed 10 September 1999	
Title of Invention DEVICE AND METHOD FOR PLACING LOOSE SHEET PRODUCTS					
Applicant(s) for DO/EO/US Frank HOFMANN et al.		Assignee			

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items under 35 USC 371:

1. ☒ This is a **FIRST** submission of items concerning a filing under *35 USC 371*.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under *35 USC 371*.
3. ☒ This express request to begin national examination procedures (*35 USC 371(f)*) at any time rather than delay examination until the expiration of the applicable time limit set in *35 USC 371(b)* and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed *35 USC 371(c)(2)*.
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (*35 USC 371(c)(2)*).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (*35 USC 371(c)(3)*)
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (*35 USC 371(c)(3)*).
9. ☒ An oath or declaration of the inventor(s) (*35 USC 371(c)(4)*). (☐ Executed ☒ Unexecuted)
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (*35 USC 371(c)(5)*).

Items 11 to 16 below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under *37 CFR 1.97* and *1.98*.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with *37 CFR 3.28* and *3.31* is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: 2 sheets formal drawings

Application Number (if Known) 10/069986		International Application Number PCT/EP00/08699		Attorney's Docket Number HOFM3001/JEK	
				Calculations	PTO USE ONLY
<p>17. The following fees are submitted:</p> <p>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</p> <p><input checked="" type="checkbox"/> Search report has been prepared by the EPO or JPO \$890.00</p> <p><input type="checkbox"/> International Preliminary Examination Fee paid to USPTO (37 CFR 1.482) \$710.00</p> <p><input type="checkbox"/> No International Preliminary Examination Fee paid to USPTO (37 CFR 1.482)</p> <p> but International Search Fee paid to USPTO (37 CFR 1.445(a)(2)) \$740.00</p> <p><input type="checkbox"/> Neither International Preliminary Examination Fee (37 CFR 1.482) nor</p> <p> International Search Fee (37 CFR 1.445(a)(2)) paid to USPTO \$1040.00</p> <p><input type="checkbox"/> International Preliminary Examination Fee paid to USPTO (37 CFR 1.482)</p> <p> and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00</p>					
ENTER APPROPRIATE BASIC FEE AMOUNT				\$	890.00
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).					
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	17 -20 =		× \$18.00		
Independent Claims	2 -3 =		× \$84.00		
Multiple Dependent Claims (if applicable)			+ \$280.00		
TOTAL OF ABOVE CALCULATIONS				\$	890.00
Reduction by ½ for filing by small entity, if applicable. Small Entity Status is asserted pursuant to 37 CFR 1.27 for this application.					
SUBTOTAL				\$	890.00
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).					
TOTAL NATIONAL FEE				\$	890.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property.					
TOTAL FEES ENCLOSED				\$	890.00
				Refunded:	
				Charged:	

- a. ☒ A check in the amount of **\$ 890.00** to cover the fees is enclosed.
- b. ☐ Please charge my Deposit Account Number 02-0200 in the amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account Number 02-0200. A duplicate copy of this sheet is enclosed.

Note: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

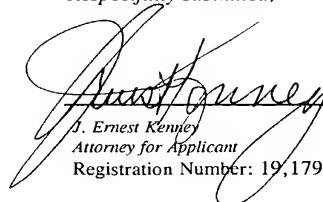


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Respectfully submitted,


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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**International Patent Application
No. PCT/EP00/08699**

PCT/DO/EO/US

International Filing Date: 06 September 2000

Attorney Docket: HOFM3001/JEK

Applicant: Frank HOFMANN et al.

For: DEVICE AND METHOD FOR PLACING LOOSE SHEET PRODUCTS

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

This paper accompanies documents submitted to establish the U.S. national stage of the above-identified international patent application.

The claims were not amended during the international phase. Before calculation of the filing fee and before examination, please amend the application as follows:

IN THE SPECIFICATION:

Please amend line 1 on page 7 to read as follows:

--What is Claimed is:--

IN THE CLAIMS:

Please amend the original as-filed claims to read as shown on the appended APPENDIX OF CLAIMS, which includes amended and non-amended claims. Also appended hereto an APPENDIX OF MARKED UP CLAIMS showing the changes which have been made.

REMARKS

All rights are reserved to the original claimed subject matter. The claims have

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been amended to reduce the filing fees and to restate the inventive subject matter in clear terms. None of the amendments are intended to narrow any element of the claims as they stood prior to amendment. Examination of the application as amended is respectfully requested.

Respectfully submitted,
~~BACON & THOMAS, PLLC~~

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Date: March 8, 2002

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Attorney Docket: HOFM3001/JEK

APPENDIX OF CLAIMS

1(Amended). Apparatus for depositing loose sheet material such as papers of value and bank notes, comprising a transport apparatus arranged to transport the sheet material and a stacking unit for depositing the sheet material in a deposit device as well as a strapping unit, wherein the deposit device is arranged for selective deposition loose and/or strapped sheet material.

2(Amended). Apparatus according to claim 1, wherein the deposit apparatus includes a movable plate which is positioned above a deposit bin in a first operating mode and positioned outside the area of the deposit bin in a second operating mode.

3(Amended). Apparatus according to claim 1, wherein the strapping unit is arranged in swiveling fashion in a door of the apparatus.

4(Amended). Apparatus according to claim 1, wherein the deposit device is configured as a tandem unit with two deposit bins each having a stacking unit associated therewith.

5(Amended). Apparatus according to claim 1, wherein the deposit device includes a sensor arranged to determine the height of an already deposited stack of sheets.

6(Amended). Apparatus according to claim 5, wherein one of the deposit device and deposit bin contains a vertically displaceable bottom which is displaceable in dependence on the sensor evaluation and a selected operating mode.

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7(Amended). Apparatus according to claim 6, wherein the displaceable bottom is lowered in steps in the operating mode for strapped deposit.

8(Amended). Apparatus according to claim 6, wherein the displaceable bottom is lowerable continuously or in steps in the operating mode for loose stacking.

9(Amended). Apparatus according to claim 1, including a deposit bin for stacking sheet material, wherein the deposit bin is arranged as a removal aid.

10(Amended). Apparatus according to claim 1, including a deposit bin for stacking sheet material, where the deposit bin is arranged as a safety bin.

11(Amended). Apparatus according to claim 2, including a movable clamping apparatus disposed above the movable plate, said clamping apparatus being lowerable onto a stack of sheet material and arranged to deliver the stack to the strapping unit.

12(Amended). Apparatus according to claim 1, including a gripper arranged to transport the sheet material into the strapping unit.

13(Amended). Apparatus according to claim 1, wherein the strapping unit includes a printer for printing the strap with data relating to the sheet material.

14(Amended). A method for depositing loose sheet material such as papers of value and bank notes, wherein sheet material is supplied by means of a transport unit to a stacking unit which deposits the sheet material in a deposit unit, comprising selectively depositing the sheet material in loose or strapped form in a deposit bin of the deposit unit.

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15(Amended). A method according to claim 14, wherein:

for a strapped deposit a movable plate is positioned above the deposit bin, and the sheet material is deposited on said plate until a predetermined number of sheets or predetermined stack height has been reached,

the deposited sheet material is held on the movable plate and guided into a strapping unit with a clamping apparatus or transported into the strapping unit by means of a gripper, and

the movable plate is withdrawn and the stack of sheets stripped above the deposit bin.

16(Amended). The method according to claim 14, wherein the movable plate is positioned outside the area of the deposit bin for loose deposit of sheet material in the deposit bin.

17(Amended). The method according to claim 14, including using a sensor to evaluate what height the deposited sheet material occupies within the deposit bin and in accordance with the evaluation lowering a displaceable bottom of the deposit bin sufficiently so that there is enough room for depositing a further packet or a predetermined quantity of loose sheet material in the bin.

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APPENDIX OF MARKED-UP VERSION OF CLAIMS

1(Amended). [An apparatus] Apparatus for depositing loose sheet material[, in particular] such as papers of value[,] and bank notes, [etc., having] comprising a transport apparatus [(2) for transporting the] arranged to transport the sheet material [(1)] and a stacking unit [(3)] for depositing the [bank notes] sheet material [(1)] in a deposit device as well as a strapping unit [(7)], [characterized in that] wherein the deposit device is [suitable for optionally depositing] arranged for selective deposition of loose and/or strapped sheet material [(1)].

2(Amended). [An apparatus] Apparatus according to claim 1, [characterized in that] wherein the deposit apparatus [contains] includes a movable plate [(4)] which is [disposed] positioned above a deposit bin [(6)] in a first operating mode and positioned outside the area of the deposit bin [(6)] in a second operating mode.

3(Amended). [An apparatus] Apparatus according to claim 1 [or claim 2], [characterized in that] wherein the strapping unit [(7)] is [disposed] arranged in swiveling fashion in a door of the apparatus.

4(Amended). [An apparatus] Apparatus according to [any of claims 1 to 3, characterized in that] claim 1, wherein the deposit device is [formed] configured as a tandem unit with two deposit bins [(6)] each having a stacking unit [(3)] associated therewith.

5(Amended). [An apparatus] Apparatus according to [any of claims 1 to 4, characterized in that] claim 1, wherein the deposit device [contains] includes a sensor [(11) for determining] arranged to determine the height of [the] an already deposited stack of sheets.

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6(Amended). [An apparatus] Apparatus according to [any of claims 1 to 5, characterized in that] claim 5, wherein one of the deposit device [or] and deposit bin [(6)] contains a vertically displaceable bottom [(5)] which is displaceable in dependence on the sensor evaluation and [the] a selected operating mode.

7(Amended). [An apparatus] Apparatus according to claim 6, [characterized in that] wherein the displaceable bottom [(5)] is lowered in steps in the operating mode for strapped deposit.

8(Amended). [An apparatus] Apparatus according to claim 6, [characterized in that] wherein the displaceable bottom [(5)] is lowerable continuously or in steps in the operating mode for loose stacking.

9(Amended). [An apparatus] Apparatus according to [any of claims 1 to 8, characterized in that] claim 1, including a deposit bin for stacking sheet material, wherein the deposit bin [(6) for stacking the sheet material is formed] is arranged as a removal aid.

10(Amended). [An apparatus] Apparatus according to [any of claims 1 to 8, characterized in that] claim 1, including a deposit bin for stacking sheet material, where the deposit bin [(6) for stacking the sheet material is formed] is arranged as a safety bin.

11(Amended). [An apparatus] Apparatus according to [any of claims 1 to 10, characterized in that] claim 2, including a movable clamping apparatus [is] disposed above the movable plate [(4)], said clamping apparatus being lowerable onto a stack of sheet material [to supply] and arranged to deliver the stack to the strapping unit [(7)].

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12(Amended). [An apparatus] Apparatus according to [any of claims 1 to 10, characterized in that] claim 1, including a gripper [is provided for transporting] arranged to transport the sheet material into the strapping unit.

13(Amended). [An apparatus] Apparatus according to [any of claims 1 to 12, characterized in that] claim 1, wherein the strapping unit [(7) has] includes a printer for printing the strap with data relating to the sheet material.

14(Amended). A method for depositing loose sheet material[, in particular] such as papers of value[, and bank notes, [etc.,] wherein sheet material is supplied by means of a transport unit to a stacking unit which deposits the sheet material in a deposit unit, [characterized in that the deposit is effected optionally in loose or strapped form in a deposit bin] comprising selectively depositing the sheet material in loose or strapped form in a deposit bin of the deposit unit.

15(Amended). A method according to claim 14, [characterized in that] wherein:

[-] for a strapped deposit a movable plate is positioned above the deposit bin, and the sheet material [being] is deposited on said plate until a predetermined number of sheets or predetermined stack height has been reached,

[-] the deposited sheet material is held on the movable plate and guided into a strapping unit with a clamping apparatus or transported into the strapping unit by means of a gripper, and

[-] the movable plate is withdrawn and the stack of sheets stripped above the deposit bin.

16(Amended). [A] The method according to claim 14, [characterized in that] wherein the movable plate is positioned outside the area of the deposit bin for loose deposit of sheet material in the deposit bin.

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17(Amended). [A] The method according to [any of claims 14 to 16, characterized in that] claim 14, including using a sensor [is used] to evaluate what height the deposited sheet material occupies within the deposit bin and in accordance with the evaluation lowering a displaceable bottom of the deposit bin [is lowered so far] sufficiently so that there is enough room for depositing a further packet or a predetermined quantity of loose sheet material in the bin.

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[Claims] What is claimed:-

1. An apparatus for depositing loose sheet material, in particular papers of value, bank notes, etc., having a transport apparatus (2) for transporting the sheet material (1) and a stacking unit (3) for depositing the bank notes (1) in a deposit device as well as a strapping unit (7), characterized in that the deposit device is suitable for optionally depositing loose and/or strapped sheet material (1).
2. An apparatus according to claim 1, characterized in that the deposit apparatus contains a movable plate (4) which is disposed above a deposit bin (6) in a first operating mode and positioned outside the area of the deposit bin (6) in a second operating mode.
3. An apparatus according to claim 1 or claim 2, characterized in that the strapping unit (7) is disposed in swiveling fashion in a door of the apparatus.
4. An apparatus according to any of claims 1 to 3, characterized in that the deposit device is formed as a tandem unit with two deposit bins (6) each having a stacking unit (3) associated therewith.
5. An apparatus according to any of claims 1 to 4, characterized in that the deposit device contains a sensor (11) for determining the height of the already deposited stack of sheets.
6. An apparatus according to any of claims 1 to 5, characterized in that the deposit device or deposit bin (6) contains a vertically displaceable bottom (5) which is displaceable in dependence on the sensor evaluation and the selected operating mode.
7. An apparatus according to claim 6, characterized in that the displaceable bottom (5) is lowered in steps in the operating mode for strapped deposit.
8. An apparatus according to claim 6, characterized in that the displaceable bottom (5) is lowerable continuously or in steps in the operating mode for loose stacking.
9. An apparatus according to any of claims 1 to 8, characterized in that the deposit bin (6) for stacking the sheet material is formed as a removal aid.
10. An apparatus according to any of claims 1 to 8, characterized in that the deposit bin (6) for stacking the sheet material is formed as a safety bin.

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Apparatus and method for depositing loose sheet material

This invention relates to an apparatus and method for depositing loose sheet material according to the preambles of claim 1 and claim 13.

In bank note processing machines it is known to deposit checked bank notes in bins in either loose or strapped form. German laid-open print DE 27 29 830 A1 discloses a bank note processing machine wherein the bank notes intended for processing arrive for example in packets. By means of a transport unit the packets are first supplied to an apparatus for removing straps and singling. Further, the bank notes are subjected to a precheck for rejecting those bank notes or papers of value which could cause damage when running through the transport unit. Further, the bank notes are checked for their fitness for circulation and authenticity. In a following unit, authentic bank notes unfit for circulation are supplied to a shredder system. The bank note processing machine further contains modules working in tandem operation for stacking and unstrapped deposit of bank notes unfit for circulation in specially provided bins as well as units likewise working in tandem operation for stacking and strapped deposit of bank notes fit for circulation, said unit having a strapping station associated therewith. A further unit is provided for depositing bank notes in a reject or manual reworking magazine.

The disadvantage of the bank note machine disclosed in DE 27 29 830 A1 is that separate units which are not interchangeable are provided for strapped and unstrapped deposit of bank notes.

It is therefore the problem of the invention to state an apparatus and method which provide a flexible possibility for depositing sheet material.

This problem is solved by an apparatus according to claim 1 and a method according to claim 14.

According to claim 1, it is provided that the deposit device is suitable for optionally depositing loose and/or strapped sheet material. Accordingly, the method according to claim 14 provides that the sheet material can be deposited optionally in loose or strapped form in one type of bin.

The invention achieves the advantage that the deposit units for loose and strapped sheet material deposit are interchangeable. This leads to lower production

costs since the deposit apparatuses can be produced in larger numbers of pieces due to the optional use.

According to an advantageous embodiment of the invention, the deposit apparatus contains a movable plate. In a first operating mode intended for strapped deposit of bank notes or papers of value, said movable plate is disposed above a deposit bin while, in a second operating mode intended for loose deposit of sheet material, it is disposed outside the area of the deposit bin to permit direct deposit of sheet material in the deposit bin via a displaceable bottom.

This results in an apparatus which also permits, for strapped deposit of sheet material, the latter to be first stacked on the plate in order to be supplied to a strapping unit.

It has further proved advantageous to dispose the strapping unit in swiveling fashion in a door of the apparatus. This assembly facilitates both the changing of strapping material and the elimination of errors or disturbances in operation, since swiveling out the strapping unit makes both the strapping unit and the deposit unit easily accessible. Further, changing the entire door with the strapping unit facilitates service.

According to a further advantageous embodiment of the inventive apparatus, the deposit device can be executed as a tandem unit with two deposit bins, each deposit bin having a stacking unit associated therewith. This means that the operation of the bank note processing machine need not be interrupted for a change of bin. When one bin is full the sheet material is supplied to the other stacking unit and thus the other deposit bin.

It is further provided to dispose at least one sensor in the deposit device for determining the height of the already deposited stack of sheets or the distance of the sheet material from the stacking wheel. Said sensor can firstly be used to ascertain how much sheet material can still be deposited in the bin before it is necessary to switch to the other. Secondly, the bottom, which is vertically displaceable according to a further advantageous embodiment of the apparatus, can, when a certain fill level has been reached, be lowered so far that there is enough room to receive a strapped packet or a predetermined quantity of loose sheet material in the bin without the height of fall to the bottom or to the sheet material already located in the bin becoming too great. An

excessive height of fall could result in a packet canting or in irregular deposit of loose sheet material. A further sensor is preferably disposed in the lower moving area of the vertically displaceable bottom (lift), said sensor being used both for initializing the lift and as a reference for the residual fill level in the deposit bin.

It has proved advantageous in particular for the deposit of strapped packets if the displaceable bottom is lowered in steps, the lowering being effected in roughly the thickness of one packet at a time.

Stepwise lowering is likewise possible for loose stacking, it also being advantageous for this type of stacking to lower the bottom continuously so that the loose sheet material can be brought into the deposit bin with a very low height of fall.

The inventive apparatus further provides that the deposit bin is formed as a removal aid for removing a stack of sheets from the deposit device for them to be transferred to corresponding bins in accordance with the further processing or use of the sheet material. The deposit bin can be formed as a safety bin in particular if bank notes are to be deposited therein.

In particular if the deposit bin is formed as a removal aid, the inventive apparatus can be used in advantageous fashion to deposit the sheet material in a single bin in mixed form, i.e. both loose and strapped, it being separated only in later processing or use. This is of advantage in particular for smaller bank note processing machines, since there is no need for several different deposit devices in this case but the total sheet material can be deposited in a single bin, which might also be formed as a tandem unit.

For strapping, it is advantageous if a movable clamping apparatus is disposed above the movable plate, as described in claim 11. Said movable clamping apparatus is lowerable onto the stack of sheet material so that sheet material deposited on the movable plate for strapping can be held reliably when being supplied to the strapping unit. Alternatively, sheet material can be supplied to the strapping unit by means of a gripper.

A further advantage is obtained if a printer is disposed before the strapping unit for printing the strap with data relating to the sheet material. This permits the data relating to the packet of sheet material to be applied after preparation of the packet. This has the advantage of facilitating error processing, if for example the packet contains

contains too few bank notes or other disturbances have occurred. According to the invention the print data are only applied when a packet has been properly supplied to the strapping unit.

Besides the apparatus, the invention also provides a method for depositing loose sheet material which is likewise characterized in that the deposit of sheet material can be effected optionally in loose or strapped form in a single type of bin.

An advantageous embodiment of said method provides that, for strapped deposit, a movable plate is positioned above the deposit bin, the sheet material being deposited on said plate until a predetermined number of sheets or predetermined stack height has been reached. In areas of said predetermined number of sheets or predetermined stack height a clamping apparatus can be lowered onto the stack of sheets to hold the deposited sheet material firmly on the movable plate, thereby permitting reliable supply to a strapping unit. After strapping, which is done by drawing the strap over the packet of sheet material and the movable plate, the movable plate is withdrawn and the stack of sheets is stripped above the deposit bin. Alternatively, the sheet material can be supplied to the strapping unit by means of a gripper.

For loose stacking, the method provides that the movable plate is brought into a position outside the area of the deposit bin so that the bin is exposed and the loose sheet material can be deposited directly in the bin. Advantageously, a sensor is then used to evaluate what height is available between the upper edge of the bin and the bottom of the bin or the deposited sheet material. This permits the lowering of the movable bottom to be regulated so that the bottom is lowered so far that the height of fall of loose or strapped sheet material via the reception of a predetermined quantity is sufficient but nevertheless not too great.

In the following, the invention will be explained in more detail with reference to Figs. 1 to 5, in which:

- Fig. 1 shows a schematic representation of the inventive apparatus,
- Fig. 2 shows a detail of Fig. 1 for strapped stacking in the initial position,
- Fig. 3 shows the same detail when strapping a packet of sheet material,
- Fig. 4 shows the detail with the displaceable plate moved out,
- Fig. 5 shows the detail again in the initial position.

Fig. 1 shows the inventive apparatus for depositing loose sheet material 1. To make it easier, the representation of housing parts has been omitted. Loose sheet material 1 is supplied by means of transport path 2 to stacking unit 3. Stacking unit 3 substantially comprises a stacker drum having spiral-shaped dividers to form the individual slots. The stacker drum has associated therewith a stripper which removes the bank notes from the stacker drum and deposits them on collecting plate 4 in the position of said plate 4 shown in Fig. 1.

Disposed below stacking unit 3 or collecting plate 4 is bin 6 whose bottom 5 is designed as displaceable bottom (lift). The displaceable bottom is displaced vertically by means of driving motor 9 and driving mechanism 10. Fig. 1 further shows areas 11 in which one or more sensors can be disposed for detecting the height of the stacked sheet material and providing accordingly detected signals to an evaluation unit not shown in the figure. The evaluation unit drives driving motor 9 for displaceable bottom 5. The evaluation unit can be formed e.g. by a microcomputer. For initializing the lift and as a reference for the residual fill level

Fig. 1 further shows strapping unit 7 which is disposed schematically on the deposit apparatus. Strapping unit 7 is preferably executed to swivel in the form of a door of the housing not shown. This execution of strapping unit 7 allows both easy changing of the strapping material and easy access to stacking unit 3 or bin 6, permitting disturbances in the operating sequence to be easily eliminated. Strapping unit 7 can further be provided with a viewing window or viewing slit on the outside so that the supply of strapping material is also readily recognizable. Disturbances can advantageously be eliminated by replacing the door together with strapping unit 7 by another door with another strapping unit.

Fig. 2 shows a detail of Fig. 1 showing in particular stacking unit 3 and the upper area of bin 6. In Fig. 2 displaceable bottom 5 is in its initial position, i.e. the bottom is moved up as far as collecting plate 4, i.e. to the upper stop point.

Fig. 2 shows the initial position of a first operating mode for depositing packets of bank notes or papers of value to be strapped, wherein collecting plate 4 is disposed above bin 6 or above lift 7 or below stacking unit 3.

During operation for strapped deposit, sheet material is deposited by stacking unit 3 on collecting plate 4 until the stack of sheets has reached a certain predeter-

predetermined height or, as is usually the case in bank note processing for example, until a certain number of bank notes, for example one hundred bank notes, is disposed on collecting plate 4.

Fig. 3 shows the next step in which a packet of bank notes 1 is moved by means of collecting plate 4 into strapping unit 7. To prevent bank notes 1 from slipping during the moving of collecting plate 4, a clamping apparatus not shown can be used for urging bank notes 1 against collecting plate 4. In strapping unit 7 the packet is provided with a strap which surrounds both the sheet material and collecting plate 4. Strapping unit 7 can further be provided with a printing device not shown in the figure, so that the print data relating to the strapped packet of sheet material can advantageously be applied to the strap directly during or after strapping.

In the next step, shown in Fig. 4, movable plate 4 including strapped packet 1 has been moved back, collecting plate 4 being moved outside the area of stacking unit 3 or bin 6. The strapped packet was held within the deposit area by means of stripper 8 so that it could fall onto movable bottom 5 in bin 6. Movable bottom 5 has meanwhile been moved downward by the stack height of one packet so that the packet stripped by stripper 8 has found room in the bin.

Fig. 5 shows a position corresponding to Fig. 2, the only difference being that a deposited packet is already disposed on movable bottom 5 which is displaced downward by the stack height of one packet.

In a second operating mode for depositing loose bank notes or papers of value, collecting plate 4 is brought into a position outside the area of deposit bin 6, as shown e.g. in Fig. 4. The bank notes are then deposited directly onto bottom 5 or onto the bank notes or bundles of bank notes already deposited there before. The continuous or stepwise lowering of bottom 5 is controlled by means of the sensor described above.

Claims

1. An apparatus for depositing loose sheet material, in particular papers of value, bank notes, etc., having a transport apparatus (2) for transporting the sheet material (1) and a stacking unit (3) for depositing the bank notes (1) in a deposit device as well as a strapping unit (7), characterized in that the deposit device is suitable for optionally depositing loose and/or strapped sheet material (1).
2. An apparatus according to claim 1, characterized in that the deposit apparatus contains a movable plate (4) which is disposed above a deposit bin (6) in a first operating mode and positioned outside the area of the deposit bin (6) in a second operating mode.
3. An apparatus according to claim 1 or claim 2, characterized in that the strapping unit (7) is disposed in swiveling fashion in a door of the apparatus.
4. An apparatus according to any of claims 1 to 3, characterized in that the deposit device is formed as a tandem unit with two deposit bins (6) each having a stacking unit (3) associated therewith.
5. An apparatus according to any of claims 1 to 4, characterized in that the deposit device contains a sensor (11) for determining the height of the already deposited stack of sheets.
6. An apparatus according to any of claims 1 to 5, characterized in that the deposit device or deposit bin (6) contains a vertically displaceable bottom (5) which is displaceable in dependence on the sensor evaluation and the selected operating mode.
7. An apparatus according to claim 6, characterized in that the displaceable bottom (5) is lowered in steps in the operating mode for strapped deposit.
8. An apparatus according to claim 6, characterized in that the displaceable bottom (5) is lowerable continuously or in steps in the operating mode for loose stacking.
9. An apparatus according to any of claims 1 to 8, characterized in that the deposit bin (6) for stacking the sheet material is formed as a removal aid.
10. An apparatus according to any of claims 1 to 8, characterized in that the deposit bin (6) for stacking the sheet material is formed as a safety bin.

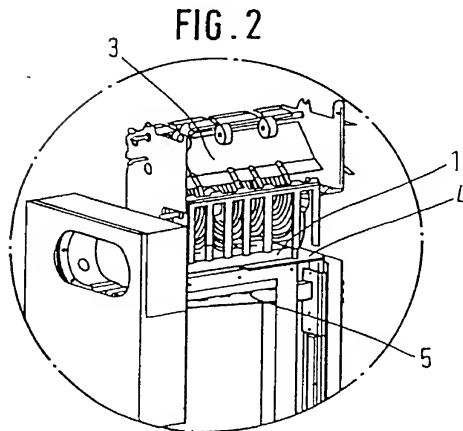
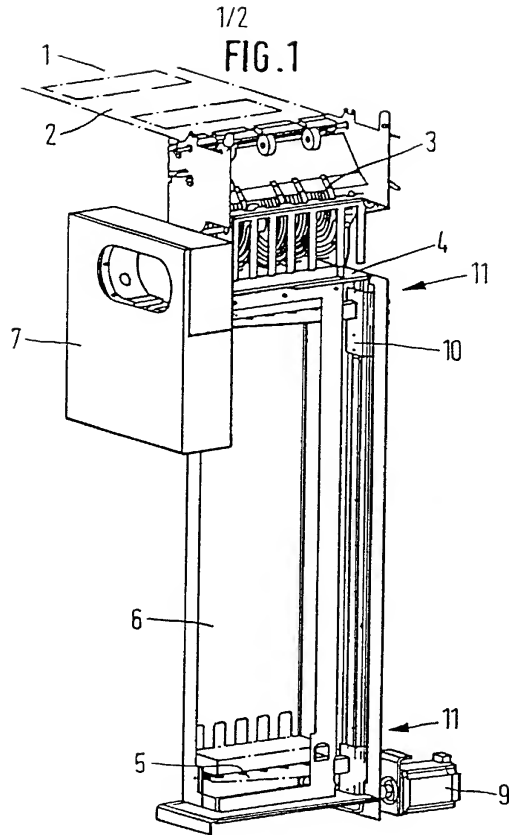
11. An apparatus according to any of claims 1 to 10, characterized in that a movable clamping apparatus is disposed above the movable plate (4), being lowerable onto a stack of sheet material to supply the stack to the strapping unit (7).
12. An apparatus according to any of claims 1 to 10, characterized in that a gripper is provided for transporting the sheet material into the strapping unit.
13. An apparatus according to any of claims 1 to 12, characterized in that the strapping unit (7) has a printer for printing the strap with data relating to the sheet material.
14. A method for depositing loose sheet material, in particular papers of value, bank notes, etc., wherein sheet material is supplied by means of a transport unit to a stacking unit which deposits the sheet material in a deposit unit, characterized in that the deposit is effected optionally in loose or strapped form in a deposit bin.
15. A method according to claim 14, characterized in that
 - for strapped deposit a movable plate is positioned above the deposit bin, the sheet material being deposited on said plate until a predetermined number of sheets or predetermined stack height has been reached,
 - the deposited sheet material is held on the movable plate and guided into a strapping unit with a clamping apparatus or transported into the strapping unit by means of a gripper,
 - the movable plate is withdrawn and the stack of sheets stripped above the deposit bin.
16. A method according to claim 14, characterized in that the movable plate is positioned outside the area of the deposit bin for loose deposit of sheet material in the deposit bin.
17. A method according to any of claims 14 to 16, characterized in that a sensor is used to evaluate what height the deposited sheet material occupies within the deposit bin and in accordance with the evaluation a displaceable bottom of the deposit bin is lowered so far that there is enough room for depositing a further packet or a predetermined quantity of loose sheet material.

Abstract

The invention relates to an apparatus for depositing loose sheet material, in particular papers of value, bank notes, etc., having a transport apparatus (2) for transporting the sheet material (1) and a stacking unit (3) for depositing the bank notes (1) in a deposit device as well as a strapping unit (7). In such deposit apparatuses it is usual to provide special deposit devices for depositing loose and strapped sheet material, said devices consequently not being interchangeable.

It is therefore the problem of the invention to state an apparatus and method for providing a flexible possibility of depositing sheet material. This is obtained by using a deposit device which is suitable for optionally depositing loose and/or strapped sheet material (1).

Fig. 1



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FIG. 3

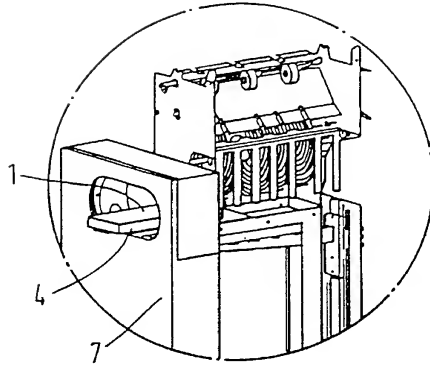


FIG. 4

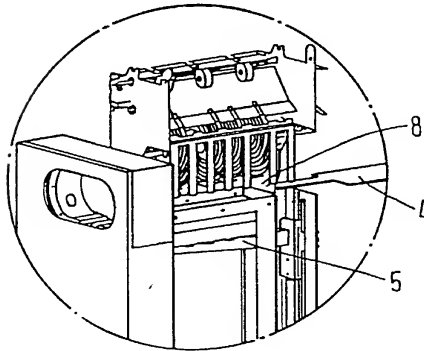
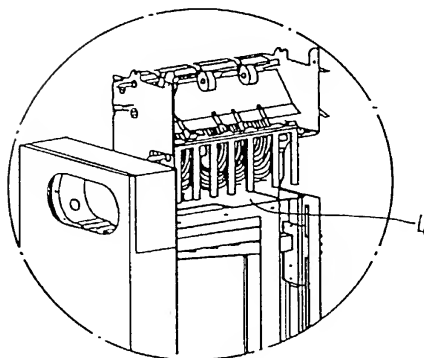


FIG. 5



ATTORNEY/DOCKET NO: HOFM3001/JEK

DECLARATION FOR PATENT APPLICATION AND APPOINTMENT OF ATTORNEY

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name; I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention (Design, if applicable) entitled.

DEVICE AND METHOD FOR PLACING LOOSE SHEET PRODUCTS

the specification of which (check one)

☐ is attached hereto, or ☒ was filed on: **06 September 2000**

as U.S. Application Number or PCT

International Application Number: **(PCT/EP00/08699) 10/069,986**

and (if applicable) was amended on:

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above. I acknowledge the duty to disclose information which is material to patentability as defined in *Title 37, Code of Federal Regulations, §1.56*. I hereby claim foreign priority benefits under *Title 35, United States Code §119* of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN APPLICATION(S)			PRIORITY CLAIMED	
Number	Country	Day/Month/Year Filed	Yes	No
199 43 486.7	Germany	10 September 1999	X	

☐ Additional Priority Application(s) Listed on Following Page(s)

I HEREBY CLAIM THE BENEFIT UNDER TITLE 35 U.S. CODE §119(E) OF ANY U.S. PROVISIONAL APPLICATIONS LISTED BELOW.	
Application Number	Day/Month/Year Filed

☐ Additional Provisional Application(s) Listed on Following Page(s)

I hereby claim the benefit under *Title 35, United States Code, §120* of any United States application(s) or PCT international application(s) designating The United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of *Title 35, United States Code, §112*, I acknowledge the duty to disclose information which is material to patentability as defined in *Title 37, Code of Federal Regulations, §1.56* which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

Application Number	Filing Date	Status - Patented, Pending or Abandoned

☐ Additional US/PCT Priority Application(s) listed on Following Page(s)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: I (We) hereby appoint as my (our) attorneys, with full powers of substitution and revocation, to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. J. Ernest Kenney, Reg. No. 19,179, Eugene Mar, Reg. No. 25,893, Richard E. Fichter, Reg. No. 26,382; Thomas J. Moore, Reg. No. 28,974; Joseph DeBenedictis, Reg. No. 28,502, Benjamin E. Urcia, Reg. No. 33,805; and

I (we) authorize my(our) attorneys to accept and follow instructions from Klunker Schmitt-Nilson Hirsch regarding any matter related to the preparation, examination, grant and maintenance of this application, any continuation, continuation-in-part or divisional based thereon, and any patent resulting therefrom, until I (we) or my(our) assigns withdraw this authorization in writing.

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☒ See following page(s) for additional joint inventors.

CONTINUATION OF DECLARATION FOR PATENT APPLICATION AND APPOINTMENT OF ATTORNEY

Page 2

PRIOR FOREIGN APPLICATION(S) (35 USC §119)			PRIORITY CLAIMED	
Number	Country	Day/Month/Year Filed	Yes	No

PRIOR PROVISIONAL APPLICATIONS 35 U.S. CODE §119(e)	
Application Number	Day/Month/Year Filed

PRIOR U.S. OR PCT INTERNATIONAL APPLICATIONS (35 U.S. CODE §120)		
Application Number	Filing Date	Status - Patented, Pending or Abandoned

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DATE		SIGNATURE

☐ See following pages for additional joint inventors/priority applications.